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PATENT COOPERATION TREATY

PCT

NOTIFICATION OF ELECTION

(PCT Rule 61.2)

From the INTERNATIONAL BUREAU

To:

Assistant Commissioner for Patents
 United States Patent and Trademark
 Office
 Box PCT
 Washington, D.C. 20231
 ÉTATS-UNIS D'AMÉRIQUE

in its capacity as elected Office

Date of mailing (day/month/year) 26 August 1999 (26.08.99)	
International application No. PCT/IB99/00063	Applicant's or agent's file reference FR001B
International filing date (day/month/year) 18 January 1999 (18.01.99)	Priority date (day/month/year) 20 January 1998 (20.01.98)
Applicant POLO FILISAN, Andrea	

1. The designated Office is hereby notified of its election made:

☒ in the demand filed with the International Preliminary Examining Authority on:

11 August 1999 (11.08.99)

☐ in a notice effecting later election filed with the International Bureau on:2. The election ☒ was☐ was not

made before the expiration of 19 months from the priority date or, where Rule 32 applies, within the time limit under Rule 32.2(b).

The International Bureau of WIPO 34, chemin des Colombettes 1211 Geneva 20, Switzerland Facsimile No.: (41-22) 740.14.35	Authorized officer C. Carrié Telephone No.: (41-22) 338.83.38
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TENT COOPERATION TREATY

PCT

INTERNATIONAL SEARCH REPORT

(PCT Article 18 and Rules 43 and 44)

Applicant's or agent's file reference FR001B	FOR FURTHER ACTION see Notification of Transmittal of International Search Report (Form PCT/ISA/220) as well as, where applicable, item 5 below.	
International application No. PCT/IB 99/ 00063	International filing date (day/month/year) 18/01/1999	(Earliest) Priority Date (day/month/year) 20/01/1998
Applicant FRACARRO RADIOINDUSTRIE S.P.A. et al.		

This International Search Report has been prepared by this International Searching Authority and is transmitted to the applicant according to Article 18. A copy is being transmitted to the International Bureau.

This International Search Report consists of a total of 3 sheets.

☒ It is also accompanied by a copy of each prior art document cited in this report.

1. Basis of the report

- a. With regard to the **language**, the international search was carried out on the basis of the international application in the language in which it was filed, unless otherwise indicated under this item.

☐ the international search was carried out on the basis of a translation of the international application furnished to this Authority (Rule 23.1(b)).

- b. With regard to any **nucleotide and/or amino acid sequence** disclosed in the international application, the international search was carried out on the basis of the sequence listing :

☐ contained in the international application in written form.

☐ filed together with the international application in computer readable form.

☐ furnished subsequently to this Authority in written form.

☐ furnished subsequently to this Authority in computer readable form.

☐ the statement that the subsequently furnished written sequence listing does not go beyond the disclosure in the international application as filed has been furnished.

☐ the statement that the information recorded in computer readable form is identical to the written sequence listing has been furnished

2. ☐ **Certain claims were found unsearchable** (See Box I).

3. ☐ **Unity of invention is lacking** (see Box II).

4. With regard to the **title**,

☒ the text is approved as submitted by the applicant.

☐ the text has been established by this Authority to read as follows:

5. With regard to the **abstract**,

☒ the text is approved as submitted by the applicant.

☐ the text has been established, according to Rule 38.2(b), by this Authority as it appears in Box III. The applicant may, within one month from the date of mailing of this international search report, submit comments to this Authority.

6. The figure of the **drawings** to be published with the abstract is Figure No.

☒ as suggested by the applicant.

☐ because the applicant failed to suggest a figure.

☐ because this figure better characterizes the invention.

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☐ None of the figures.

PATENT COOPERATION TREATY

From the
INTERNATIONAL PRELIMINARY EXAMINING AUTHORITY

To:

DINI, Roberto
Via Castagnole, 59
I-10060 None (TO)
ITALIE

PCT

NOTIFICATION OF TRANSMITTAL OF
THE INTERNATIONAL PRELIMINARY
EXAMINATION REPORT

(PCT Rule 71.1)

Date of mailing
(day/month/year)

12.05.2000

Applicant's or agent's file reference
FR001B

IMPORTANT NOTIFICATION

International application No.
PCT/IB99/00063

International filing date (day/month/year)
18/01/1999

Priority date (day/month/year)
20/01/1998

Applicant
FRACARRO RADIOINDUSTRIE S.P.A. et al.

1. The applicant is hereby notified that this International Preliminary Examining Authority transmits herewith the international preliminary examination report and its annexes, if any, established on the international application.
2. A copy of the report and its annexes, if any, is being transmitted to the International Bureau for communication to all the elected Offices.
3. Where required by any of the elected Offices, the International Bureau will prepare an English translation of the report (but not of any annexes) and will transmit such translation to those Offices.

4. REMINDER

The applicant must enter the national phase before each elected Office by performing certain acts (filing translations and paying national fees) within 30 months from the priority date (or later in some Offices) (Article 39(1)) (see also the reminder sent by the International Bureau with Form PCT/IB/301).

Where a translation of the international application must be furnished to an elected Office, that translation must contain a translation of any annexes to the international preliminary examination report. It is the applicant's responsibility to prepare and furnish such translation directly to each elected Office concerned.

For further details on the applicable time limits and requirements of the elected Offices, see Volume II of the PCT Applicant's Guide.

Name and mailing address of the IPEA/



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Tel. +49 89 2399-7371



PCT

REC'D 16 MAY 2000

WIPO

PCT

INTERNATIONAL PRELIMINARY EXAMINATION REPORT

(PCT Article 36 and Rule 70)

17

Applicant's or agent's file reference FR001B	FOR FURTHER ACTION See Notification of Transmittal of International Preliminary Examination Report (Form PCT/IPEA/416)	
International application No. PCT/IB99/00063	International filing date (day/month/year) 18/01/1999	Priority date (day/month/year) 20/01/1998
International Patent Classification (IPC) or national classification and IPC H04N7/10		
Applicant FRACARRO RADIOINDUSTRIE S.P.A. et al.		

1. This international preliminary examination report has been prepared by this International Preliminary Examining Authority and is transmitted to the applicant according to Article 36.


2. This REPORT consists of a total of 6 sheets, including this cover sheet.

- ☒ This report is also accompanied by ANNEXES, i.e. sheets of the description, claims and/or drawings which have been amended and are the basis for this report and/or sheets containing rectifications made before this Authority (see Rule 70.16 and Section 607 of the Administrative Instructions under the PCT).

These annexes consist of a total of 10 sheets.

3. This report contains indications relating to the following items:

- I ☒ Basis of the report
- II ☐ Priority
- III ☐ Non-establishment of opinion with regard to novelty, inventive step and industrial applicability
- IV ☐ Lack of unity of invention
- V ☒ Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement
- VI ☐ Certain documents cited
- VII ☒ Certain defects in the international application
- VIII ☒ Certain observations on the international application

Date of submission of the demand 11/08/1999	Date of completion of this report 12.05.2000
Name and mailing address of the international preliminary examining authority:  European Patent Office D-80298 Munich Tel. +49 89 2399 - 0 Tx: 523656 epmu d Fax: +49 89 2399 - 4465	Authorized officer Berst, C Telephone No. +49 89 2399 8028



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533 Rec CT/PTO 17 JUL 2000

**INTERNATIONAL PRELIMINARY
EXAMINATION REPORT**

International application No. PCT/IB99/00063

1. Basis of the report

1. This report has been drawn on the basis of (*substitute sheets which have been furnished to the receiving Office in response to an invitation under Article 14 are referred to in this report as "originally filed" and are not annexed to the report since they do not contain amendments.*):

Description, pages:

1,3-19 as originally filed
2 with telefax of 18/02/2000

Claims, No.:

1-51 with telefax of 18/02/2000

Drawings, sheets:

1/8-8/8 as originally filed

2. The amendments have resulted in the cancellation of:

- ☐ the description, pages:
☐ the claims, Nos.:
☐ the drawings, sheets:

3. ☐ This report has been established as if (some of) the amendments had not been made, since they have been considered to go beyond the disclosure as filed (Rule 70.2(c)):

4. Additional observations, if necessary:

**INTERNATIONAL PRELIMINARY
EXAMINATION REPORT**International application No. PCT/IB99/00063

V. Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement**1. Statement**

Novelty (N)	Yes: Claims	1-39, 41-50
	No: Claims	40, 51
Inventive step (IS)	Yes: Claims	1-39, 41-50
	No: Claims	40, 51
Industrial applicability (IA)	Yes: Claims	1-51
	No: Claims	

2. Citations and explanations**see separate sheet****VII. Certain defects in the international application**

The following defects in the form or contents of the international application have been noted:

see separate sheet**VIII. Certain observations on the international application**

The following observations on the clarity of the claims, description, and drawings or on the question whether the claims are fully supported by the description, are made:

see separate sheet

**INTERNATIONAL PRELIMINARY
EXAMINATION REPORT - SEPARATE SHEET**

International application No. PCT/IB99/00063

V). Reasoned statement under Article 35(2) PCT:

- 1) The closest prior art is represented by US - A - 5 574 964 (D1), which discloses a distribution system of a plurality of received digital or analog TV, radio and data signals, to a plurality of locations according to a selection of addressed channels transmitted on a bidirectional bus. The data are individually demodulated (101 - 103) according to their standard into a non-modulated common intermediate format and next combined and remodulated into a predetermined frequency band component in a remodulator 104: see figure 2. The data are converted and filtered according to their addresses on the receiving side in interface pods (44) before being fed to receiving units (46).

EP - A - 0 457 673 (D2) discloses a home network for performing a repartition of audio and video data over different locations, the network comprising a mixer 17a, a single cable and a distributor 17b and using specific channels and addresses.

The other documents cited in the International Search Report disclose general prior art on systems for TV signal distribution and bidirectional cable TV system with a return channel for remote control.

In the present application, in order to obtain a system independent of the plurality of standards received, the received digital signals are individually demodulated and then remodulated according to one sole type of digital modulation (e.g. QAM). These modulated digital signals are then fed to a mixer (3) which outputs all the data on the distribution network, the receivers connected to the network being fit to receive the sole type of digital modulation.

Such a mixing process of signals having a sole type of digital modulation is neither disclosed nor rendered obvious by the prior art document cited in the International Search Report.

The features of independent claims 1 and 50 are based on claim 1 and on page 4, lines 17 - 25 as well as on figure 3 as originally filed.

**INTERNATIONAL PRELIMINARY
EXAMINATION REPORT - SEPARATE SHEET**

International application No. PCT/IB99/00063

For these reasons, independent claims 1 and 50 satisfy the requirements of the PCT with respect to Articles 33 (1)-(4).

Claims 2 - 39 and 41 - 49 are dependent on claim 1 and, therefore, also meet said requirements of the PCT.

- 2) The ambiguous subject matter of claim 40 (see section VIII of the present report) is known from D1, where a transponder is used in relationship with specific different channels for the different signals (see figure 1).

The ambiguous subject matter of claim 51 (see section VIII of the present report) is generally known, since the use of QAM modulation for modulating a signal is common.

For these reasons, the subject-matter of claims 40 and 51 is not new and these claims do not meet the requirements of Article 33(2) PCT.

VII). Certain defects:

- a) The first word of page 2 of the description is a repetition of the last word of page 1 and is superfluous.
- b) The independent claims are not in a correct two-part form in accordance with Rule 6.3(b) PCT, which in the present case would be appropriate, with **all** those features known in combination from the prior art (see document D1) being placed in a preamble (Rule 6.3(b)(i) PCT) and with the remaining features being included in a characterising part (Rule 6.3(b)(ii) PCT).
- c) Reference signs in parentheses should have been inserted in **all** the claims to increase their intelligibility, Rule 6.2(b) PCT. This applies to both the preamble and characterising portion.

**INTERNATIONAL PRELIMINARY
EXAMINATION REPORT - SEPARATE SHEET**

International application No. PCT/IB99/00063

VIII). Certain observations - Clarity:

Claims 40 and 51 are totally unclear (Article 6 PCT), since they do not comprise any of the features essential for carrying out the invention. This is due to claim 40 referring back to itself and claim 51 being an independent claim.

REPLACED BY
ART 34 A/MDT

financial reasons - make recourse to condominium management rules, which impose the majority's approval to implement such novelties, also considering that a high uncertainty still exists about their real cost/benefits ratio. Further inconveniences are introduced by the fact that said interactive services also require for the distribution

5 system to be capable not only of receiving signals from the provider, the so-called downstream signals, but also capable of transmitting signals to the provider, the so-called upstream signals.

Moreover, in most cases, both the programs and interactive services are supplied against payment, through a conditioned access system managed by the broadcaster

10 and based on the use of smart cards, where each user should be able to operate on the distribution system through smart cards, in order to decode the programs purchased under exclusivity.

Now, installation complexity for the systems already known will obviously increase to a considerable extent due to all these further functions required for the distribution

15 system.

The present invention has the aim of providing a distribution system which, by solving the above drawbacks, allows for the distribution of a plurality of services in a condominium and/or community environment, independently from the type of standards of the signals received and the time when such signals become available.

20 A further aim of the present invention is to provide a distribution system of digital signals in a condominium and/or community environment, which allows a gradual implementation of the system based on the free decision of each individual user, obviously without affecting the service already supplied by the system.

A further aim of the present invention is to provide a distribution system of digital

25 signals in a condominium and/or community environment, which allows each user to use said digital signals in a bi-directional way, without affecting the service already supplied by the system.

A further aim of the present invention is to provide a fast installation of the system

CLAIMS

1. A system for the distribution to a condominium and/or community environment of a plurality of television signals, and/or audio signals, and/or digital audio and/or video signals, in particular being transmitted according to different standards, comprising means (1,4,14',19) for receiving said signals transmitted through the air, and/or from satellite, and/or by cable, means (2,5,7) for the amplification and the frequency conversion of said signals, signals selection means (12,13,14,20;29;41,42,43,44) and means (3,8) for the distribution of said signals, characterized in that the selection means (12,13,14,20;29;41,42,43,44), the means (2,5,7) for the amplification and the frequency conversion of said signals and said means (3,8) for the distribution of said signals demodulate digital signals having different transmission standards and remodulate them according to a sole type of modulation, for then distributing them to the users of the system by means of a sole distribution support (8).

2. A system for the distribution to a condominium and/or community environment, according to claim 1, characterized in that the digital signal are remodulated in Quadrature Amplitude Modulation (QAM).

3. A system for the distribution to a condominium and/or community environment, according to claim 1, characterized in that one or more digital signals can be received by a single user of the system through a frequency conversion in a predetermined channel which can be accessed by said user only, and in that the digital signal being present in said channel can be selected by said user through control means (11,17,18;40;51) which send a control signal to selection means (12,13,14,20;29;41,42,43,44).

4. A system for the distribution to a condominium and/or community environment, according to claim 1, characterized in that the means (3,8) for the distribution of said signals comprise a distribution support (8) realized by means of a coaxial cable.

5. A system for the distribution to a condominium and/or community environment, according to claim 3, characterized in that the means (3,8) for the distribution of said signals comprise MMDS and/or LMDS networks.

6. A system for the distribution to a condominium and/or community environment, according to claim 3, characterized in that said predetermined channel is 8 MHz wide.

7. A system for the distribution to a condominium and/or community environment, according to claim 3, characterized in that said predetermined channel is contained in a frequency band being comprised between 47 to 862 MHz.

8. A system for the distribution to a condominium and/or community environment, according to claim 7, characterized in that said frequency band ranges preferably from 230 to 445 MHz.

9. A system for the distribution to a condominium and/or community environment, according to claim 3, characterized in that filter means (15,16) are provided, which operate where the signal distribution means (3,8) distribute the signals to the single user.

10. A system for the distribution to a condominium and/or community environment, according to claim 3, characterized in that the signals, prior to their distribution to the single user, pass through a band-stop filter (15) so that the reception of the signals contained in said band by a receiver (18) associated with the single user is eliminated.

11. A system for the distribution to a condominium and/or community environment, according to claim 10, characterized in that a channel-pass filter (16) is arranged in parallel to said band-stop filter, which is apt to let the predetermined channel pass through to the single user.

12. A system for the distribution to a condominium and/or community environment, according to claim 3, characterized in that the selection of the digital signal to be converted in said predetermined channel is performed by a return-

channel.

13. A system for the distribution to a condominium and/or community environment, according to claim 12, characterized in that said return-channel is FSK modulated.

5 14. A system for the distribution to a condominium and/or community environment, according to claim 12, characterized in that said return-channel is PSK modulated.

15 15. A system for the distribution to a condominium and/or community environment, according to claim 12, characterized in that said return-channel is QPSK modulated.

16. A system for the distribution to a condominium and/or community environment, according to claim 12, characterized in that said return channel is QAM modulated.

15 17. A system for the distribution to a condominium and/or community environment, according to claim 12, characterized in that said return channel is bi-directional under TDMA procedure.

18. A system for the distribution to a condominium and/or community environment, according to claim 12, characterized in that said return channel has a band width of 128 KHz or multiples of it.

20 19. A system for the distribution to a condominium and/or community environment, according to claim 12, characterized in that said return channel is comprised between 41 and 46.5 MHz.

25 20. A system for the distribution to a condominium and/or community environment, according to claim 12, characterized in that said return channel uses the same coaxial cable of the system.

21. A system for the distribution to a condominium and/or community environment, according to claim 12, characterized in that the return channel used by a user is not accessible to all other users of the system.

22. A system for the distribution to a condominium and/or community environment, according to claim 12, characterized in that said return-channel is radiofrequency irradiated.

23. A system for the distribution to a condominium and/or community environment, according to claim 1, characterized in that the selection, the modulation and the frequency conversion in a predetermined channel of the digital signal are obtained by means of a transmodulator (13,20;29;41,42,43,44).

24. A system for the distribution to a condominium and/or community environment, according to claim 1, characterized in that a user terminal (17) and an IRD receiver-decoder (18;40;51) are provided, which can be operated by a same remote-control (11).

25. A system for the distribution to a condominium and/or community environment, according to claim 1, characterized in that it comprises a set of aerials (1,4,19) for the reception of both analog and digital radio/television signals, means (2,5,7) for the amplification and the frequency conversion of said signals, transmodulator means (13,20), at least a band-stop filter (15), a signals mixer (3), at least a transponder preselection circuit (12), a selection circuit of digital signals by cable (14), at least a channel-pass filter (16) arranged in parallel to said band-stop filter (15), at least a user terminal (17) to which there are associated at least:

- a remote control device (11),
- an IRD receiver-decoder (18),
- an image display (10).

26. A system for the distribution to a condominium and/or community environment, according to claim 25, characterized in that the transmodulator means (13,20) produces output signals being Quadrature Amplitude Modulation (QAM).

27. A system for the distribution of a plurality of radio-television signals (1,4,14;19) transmitted by air and/or from satellite and/or by cable, comprising means for the picking up and/or the reception of said signals, means for the

amplification of said signals and means for the distribution of said signals, characterized in that filter means (15) are provided to prevent a passage of a portion of said signals (digital signals) to all the users of the system, and filter means (16) for allowing the passage of said portion of said signals (digital signals) only to one or
5 more of said users.

28. A system for the distribution to a condominium and/or community environment, according to claim 1, characterized in that two or more selection means (13,14,20) are contained in a sole transmodulator device (29).

29. A system for the distribution to a condominium and/or community
10 environment, according to claim 28, characterized in that said sole transmodulator device (29) comprises tuner means (30,32,34), which are apt to perform the selection of said digital signals within at least two frequency ranges, and demodulation means (31,33,35), which are apt to demodulate at least two of said digital signals transmitted with different standards.

15 30. A system for the distribution to a condominium and/or community environment, according to claim 29, characterized in that said transmodulator device (29) includes at least two tuners (30,32,34) for the selection of digital signals, and at least two demodulators (31,33,35) of said digital signals.

20 31. A system for the distribution to a condominium and/or community environment, according to claim 29, characterized in that said transmodulator device (29) also includes a commutator (36) apt for receiving the digital signals coming from said demodulators (31,33,35).

25 32. A system for the distribution to a condominium and/or community environment, according to claim 29, characterized in that said transmodulator device (29) also comprises a modulator (37) for remodulating the output signal of the commutator (36).

33. A system for the distribution to a condominium and/or community environment, according to claim 29, characterized in that said transmodulator device

(29) also includes a converter (38) for converting in frequency the output signal of said modulator (37) into a predetermined channel.

34. A system for the distribution to a condominium and/or community environment, according to claim 1, characterized in that said control means
5 (11,17,18;40) are also apt to generate one or more digital signals in transmission or upstream signals (US) and convert them in frequency into the predetermined channel which can be accessed by said user only, and that second selection and handling means (41,43) are provided for said digital signals in transmission, and means (4,14') for the transmission of said upstream signals (US) from satellite and/or by cable.

10 35. A system for the distribution to a condominium and/or community environment, according to claim 34, characterized in that the selection means (42,44) and the second selection means (41,43) operate on the received downstream signals (DS) or on upstream signals (US) QAM modulated under SCPC procedure, respectively.

15 36. A system for the distribution to a condominium and/or community environment, according to claim 34, characterized in that said predetermined channel which can be accessed by said user only is used under FDMA procedure, i.e. the upstream signals (US) and downstream signals (DS) are simultaneously present in said predetermined channel.

20 37. A system for the distribution to a condominium and/or community environment, according to claim 36, characterized in that in said predetermined channel which can be accessed by said user only both the upstream signals (US) and the downstream signals (DS) occupy not overlapping frequency bands.

25 38. A system for the distribution to a condominium and/or community environment, according to claim 34, characterized in that the predetermined channel which can be accessed by said user only is used under TDMA procedure, i.e. both the upstream signals (US) and the downstream signals (DS) are not simultaneously present in the predetermined channel.

39. A system for the distribution to a condominium and/or community environment, according to claim 34, characterized in that said selection means (42,44) and said second selection and handling means (41,43) are comprised in a single container.

5 40. A system for the distribution to a condominium and/or community environment, according to claim 1, characterized in that the control means (21), for performing an access function to a plurality of conditioned access services, are apt to read the information contained in a smart card (52), and that that said information contained in said smart card (52) control the selection of said predetermined channel
10 which can be accessed by said user only.

41. A system for the distribution to a condominium and/or community environment, according to claim 40, characterized in that said information contained in the smart card (52) comprise information for tuning transmodulator means (13,14,20;29;41,42,43,44) pertaining to the selection means (12,13,14,20;29;
15 41,42,43,44).

42. A system for the distribution to a condominium and/or community environment, according to claim 40, characterized in that said information contained in the smart card (52) comprise information for the tuning of transponder preselection means (12) pertaining to selection means (12,13,14,20;29;41,42, 43,44).

20 43. A system for the distribution to a condominium and/or community environment, according to claim 43, characterized in that the information for the tuning of the transponder preselection means (12) are selection information of the bands of the channels to be tuned.

44. A system for the distribution to a condominium and/or community
25 environment, according to claim 41, characterized in that information for the tuning of the transponder preselection means (12) are information for determining the polarization of the channels to be tuned.

45. A system for the distribution to a condominium and/or community

environment, according to claim 41, characterized in that said information contained in the smart card (52) comprise frequencies information of the channels to be tuned.

46. A system for the distribution to a condominium and/or community environment, according to claim 40, characterized in that said information contained
5 in the smart card (52) also comprise frequency information of said channel which can be accessed by said user only.

47. A system for the distribution to a condominium and/or community environment, according to claim 40, characterized in that the selection means (12,13,14,20;29;41,42,43,44) and the smart card (52) contain respective electronic
10 keys, whose congruence enables the operation of said distribution system of a plurality of signals to a condominium and/or community environment.

48. A system for the distribution to a condominium and/or community environment, according to claim 40, characterized in that the control means (51) contain a device for writing data in a program memory of a microprocessor contained
15 in the smart card (52).

49. A system for the distribution to a condominium and/or community environment, according to claim 48, characterized in that said program memory is an EEPROM type memory.

50. A system for the distribution to a condominium and/or community
20 environment, according to claim 48, characterized in that the device for writing data in a program memory of a microprocessor contained in the smart card (52) operates on data sent to the control means (51) by modem.

51. A system for the distribution to a condominium and/or community environment, according to claim 48, characterized in that said device for writing data
25 in a program memory of a microprocessor contained in the smart card (52) operates on data sent to the control means (51) by means of the Service Information contained in the received digital signal.

52. A system for the distribution to a condominium and/or community

environment, according to claim 27, characterized in that said filter means (15) are apt to prevent the passage of signals generated inside a further distribution network associated to a single user, in particular being inside a dwelling or flat.

CLAIMS

1. A system for the distribution to a condominium and/or community environment of a plurality of digital signals being transmitted according to different standards, said digital signal being distributed together other information signals, comprising means (1,4,14',19) for receiving said digital signals, means (13, 14, 20) for the
5 frequency conversion of said digital signals, means (3) for mixing all said information signals on a distribution network (8) feeding a plurality of signal sockets (9) connected to receivers (18), among which at least a part is intended to receive the digital signals characterized in that the means (13, 14, 20) for the frequency conversion of said digital signals comprises means for demodulating
10 digital signals having different transmission standards and means for remodulating said digital signals with a sole type of digital modulation (QAM), providing the digital signals with said sole type of modulation (QAM) to the means (3) for mixing said information signals on the distribution network (8), and that the receivers (18) intended to receive the digital signals are fit to decode such sole type of modulation
15 (QAM).

2. A system for the distribution to a condominium and/or community environment, according to claim 1, characterized in that the such sole type of modulation (QAM) is Quadrature Amplitude Modulation (QAM).

3. A system for the distribution to a condominium and/or community
20 environment, according to claim 1, characterized in that the means (13, 14, 20) for the frequency conversion of said digital signals are means (13, 14, 20) for frequency converting one or more of the received reserved digital signals in reserved frequency portions (S1), or personal channels, of the band, said personal channels (S1) being reserved to the corresponding predetermined signal sockets (9), and forbidden to the
25 remaining sockets (9) through means (15, 16) for allowing access to said personal channels (S1) of the band only to the corresponding signal sockets (9), said means

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financial reasons - make recourse to condominium management rules, which impose the majority's approval to implement such novelties, also considering that a high uncertainty still exists about their real cost/benefits ratio. Further inconveniences are introduced by the fact that said interactive services also require for the distribution system to be capable not only of receiving signals from the provider, the so-called downstream signals, but also capable of transmitting signals to the provider, the so-called upstream signals.

Moreover, in most cases, both the programs and interactive services are supplied against payment, through a conditioned access system managed by the broadcaster and based on the use of smart cards, where each user should be able to operate on the distribution system through smart cards, in order to decode the programs purchased under exclusivity.

Now, installation complexity for the systems already known will obviously increase to a considerable extent due to all these further functions required for the distribution system.

From document US-A-5 574 964 is known a system for the distribution of multiple received signals having different formats using a single pre-existing network.

The system there disclosed provides for a preliminary conversion of all received signals in a bus signal having a certain bandwidth (1GHz). Said bus signal runs on a bus constituting the distribution network. Each received signal is converted in a predetermined, frequency position place on the span of said bandwidth. A control computer interfaced to the bus, also adds addresses and commands in predetermined frequency position to the bus signals, according to the user needs.

From document EP-A-0 457 673, is known a control system of audio-video reproducing apparatuses in a community. Said system is so conceived that the audiovideo information coming out from each electronic apparatus is frequency multiplexed in a specific channel on a common bus signal. Further, a channel content information is provided, indicating the audio video information allocated to the respective channels and an information indicating the room (the socket) using the electronic apparatus and its related channel. The reason for giving such informations is to let the other users know the channels and apparatuses that are in use, in order to avoid the selection of said used channels and the disturbance of the system.

The present invention has the aim of providing a distribution system which, by solving the above drawbacks, allows for the distribution of a plurality of services in a condominium and/or community environment, independently from the type of standards of the signals received and the time when such signals become available.

A further aim of the present invention is to provide a distribution system of digital signals in a condominium and/or community environment, which allows a gradual implementation of the system based on the free decision of each individual user, obviously without affecting the service already supplied by the system.

A further aim of the present invention is to provide a distribution system of digital signals in a condominium and/or community environment, which allows each user to use said digital signals in a bi-directional way, without affecting the service already supplied by the system.

A further aim of the present invention is to provide a fast installation of the system

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(13, 14, 20) for frequency converting one or more of the received digital signals in personal channels (S1) of the band being commanded through respective user control means (11, 17, 18; 40; 51).

4. A system for the distribution to a condominium and/or community environment,
5 according to claim 1, characterized in that the distribution network (8) of the information signals comprise a distribution support (8) realized by means of a coaxial cable.

5. A system for the distribution to a condominium and/or community environment,
according to claim 1, characterized in that the distribution network (8) for the
10 distribution of said information signals comprise MMDS and/or LMDS networks.

6. A system for the distribution to a condominium and/or community environment,
according to claim 1, characterized in that said personal channel is 8 MHz wide..

7. A system for the distribution to a condominium and/or community environment,
according to claim 1, characterized in that said personal channel is contained in a
15 frequency band being comprised between 47 to 862 MHz.

8. A system for the distribution to a condominium and/or community environment,
according to claim 7, characterized in that said frequency band ranges preferably
from 230 to 445 MHz.

9. A system for the distribution to a condominium and/or community environment,
20 according to claim 1, characterized in that the means (15, 16) for allowing access to said personal channels (S1) comprises means (15,16) for filtering the personal channel, that are located upstream the signal socket (9).

10. A system for the distribution to a condominium and/or community environment,
according to claim 1, characterized in that said filtering means (15, 16) comprises a
25 band-stop filter (15), apt to eliminate the reception of the personal channels, by a receiver (18) through the signal socket (9).

11. A system for the distribution to a condominium and/or community environment, according to claim 10, characterized in that said filtering means (15,

16) further comprises, in correspondence of a predetermined signal socket (9), a channel-pass filter (16) is arranged in parallel to said band-stop filter (15), which is apt to let the personal channel pass through to the single user.

12. A system for the distribution to a condominium and/or community environment, according to claim 1, characterized in that the selection of the digital signal to be converted in said personal channel is performed by a return-channel.

13. A system for the distribution to a condominium and/or community environment, according to claim 12, characterized in that said return-channel is FSK modulated.

10 14. A system for the distribution to a condominium and/or community environment, according to claim 12, characterized in that said return-channel is PSK modulated.

15 15. A system for the distribution to a condominium and/or community environment, according to claim 12, characterized in that said return-channel is QPSK modulated.

16. A system for the distribution to a condominium and/or community environment, according to claim 12, characterized in that said return channel is QAM modulated.

20 17. A system for the distribution to a condominium and/or community environment, according to claim 12, characterized in that said return channel is bi-directional under TDMA procedure.

18. A system for the distribution to a condominium and/or community environment, according to claim 12, characterized in that said return channel has a band width of 128 KHz or multiples of it.

25 19. A system for the distribution to a condominium and/or community environment, according to claim 12, characterized in that said return channel is comprised between 41 and 46.5 MHz.

20. A system for the distribution to a condominium and/or community environment, according to claim 12, characterized in that said return channel uses the same coaxial cable of distribution network (8) of the system.

21. A system for the distribution to a condominium and/or community environment, according to claim 12, characterized in that the return channel used by a user is not accessible to all other users of the system.

22. A system for the distribution to a condominium and/or community environment, according to claim 12, characterized in that said return-channel is radiofrequency irradiated.

23. A system for the distribution to a condominium and/or community environment, according to claim 1, characterized in that the selection, the modulation and the frequency conversion in a predetermined channel of the digital signal are obtained by means of a transmodulator (13,20;29;41,42,43,44).

24. A system for the distribution to a condominium and/or community environment, according to claim 1, characterized in that a user terminal (17) and an IRD receiver-decoder (18;40;51) are provided, which can be operated by a same remote-control (11).

25. A system for the distribution to a condominium and/or community environment, according to claim 1, characterized in that two or more selection means (13,14,20) are contained in a sole transmodulator device (29).

26. A system for the distribution to a condominium and/or community environment, according to claim 25, characterized in that said sole transmodulator device (29) comprises tuner means (30,32,34), which are apt to perform the selection of said digital signals within at least two frequency ranges, and demodulation means (31,33,35), which are apt to demodulate at least two of said digital signals transmitted with different standards.

27. A system for the distribution to a condominium and/or community environment, according to claim 26, characterized in that said transmodulator device

(29) includes at least two tuners (30,32,34) for the selection of digital signals, and at least two demodulators (31,33,35) of said digital signals.

28. A system for the distribution to a condominium and/or community environment, according to claim 26, characterized in that said transmodulator device (29) also includes a commutator (36) apt for receiving the digital signals coming from said demodulators (31,33,35).

29. A system for the distribution to a condominium and/or community environment, according to claim 26, characterized in that said transmodulator device (29) also comprises a modulator (37) for remodulating the output signal of the commutator (36).

30. A system for the distribution to a condominium and/or community environment, according to claim 26, characterized in that said transmodulator device (29) also includes a converter (38) for converting in frequency the output signal of said modulator (37) into a predetermined channel.

31. A system for the distribution to a condominium and/or community environment, according to claim 1, characterized in that said control means (11,17,18;40) are also apt to generate one or more digital signals in transmission or upstream signals (US) and convert them in frequency into the personal channel, and that second selection and handling means (41,43) are provided for said digital signals in transmission, and means (4,14') for the transmission of said upstream signals (US) from satellite and/or by cable.

32. A system for the distribution to a condominium and/or community environment, according to claim 31, characterized in that transmodulator means (42,44) and the second selection means (41,43) operate on the received downstream signals (DS) or on upstream signals (US) QAM modulated under SCPC procedure, respectively.

33. A system for the distribution to a condominium and/or community environment, according to claim 31, characterized in that said personal channel

which can be accessed by said user only is used under FDMA procedure, i.e. the upstream signals (US) and downstream signals (DS) are simultaneously present in said personal channel.

34. A system for the distribution to a condominium and/or community environment, according to claim 33, characterized in that in said personal channel both the upstream signals (US) and the downstream signals (DS) occupy not overlapping frequency bands.

35. A system for the distribution to a condominium and/or community environment, according to claim 31, characterized in that the personal channel is used under TDMA procedure, i.e. both the upstream signals (US) and the downstream signals (DS) are not simultaneously present in the personal channel.

36. A system for the distribution to a condominium and/or community environment, according to claim 34, characterized in that said selection means (42,44) and said second selection and handling means (41,43) are comprised in a single container.

37. A system for the distribution to a condominium and/or community environment, according to claim 3, characterized in that the user control means (11, 17, 18; 40; 51) comprise a receiver (51) apt to perform an access function to a plurality of conditioned access services, by reading the information contained in a smart card (52), and that said information contained in said smart card (52) control the means (13, 14, 20) for frequency converting one or more of the received reserved digital signals in the personal channel.

38. A system for the distribution to a condominium and/or community environment, according to claim 37, characterized in that said information contained in the smart card (52) comprise information for tuning transmodulator means (13,14,20;29;41,42,43,44).

39. A system for the distribution to a condominium and/or community environment, according to claim 37, characterized in that said information contained

in the smart card (52) comprise information for the tuning of transponder preselection means (12).

40. A system for the distribution to a condominium and/or community environment, according to claim 40, characterized in that the information for the tuning of the transponder preselection means (12) are selection information of the bands of the channels to be tuned.

41. A system for the distribution to a condominium and/or community environment, according to claim 38, characterized in that information for the tuning of the transponder preselection means (12) are information for determining the polarization of the channels to be tuned.

42. A system for the distribution to a condominium and/or community environment, according to claim 38, characterized in that said information contained in the smart card (52) comprise frequencies information of the channels to be tuned.

43. A system for the distribution to a condominium and/or community environment, according to claim 37, characterized in that said information contained in the smart card (52) also comprise frequency information of said personal channel.

44. A system for the distribution to a condominium and/or community environment, according to claim 37, characterized in that the selection means (12,13,14,20;29;41,42,43,44) and the smart card (52) contain respective electronic keys, whose congruence enables the operation of said distribution system of a plurality of signals to a condominium and/or community environment.

45. A system for the distribution to a condominium and/or community environment, according to claim 37, characterized in that the control means (51) contain a device for writing data in a program memory of a microprocessor contained in the smart card (52).

46. A system for the distribution to a condominium and/or community environment, according to claim 45, characterized in that said program memory is an EEPROM type memory.

47. A system for the distribution to a condominium and/or community environment, according to claim 45, characterized in that the device for writing data in a program memory of a microprocessor contained in the smart card (52) operates on data sent to the control means (51) by modem.

5 48. A system for the distribution to a condominium and/or community environment, according to claim 45, characterized in that said device for writing data in a program memory of a microprocessor contained in the smart card (52) operates on data sent to the control means (51) by means of the Service Information contained in the received digital signal.

10 49. A system for the distribution to a condominium and/or community environment, according to claim 1, characterized in that said means (15, 16) for allowing access to said personal channels (S1) are apt to prevent the passage of signals generated inside a further distribution network associated to a signal socket (9), in particular being inside a dwelling or flat.

15 50. Method for the distribution to a condominium and/or community environment, of a plurality of digital signals together with other information signals, at least some of digital signals being reserved to predetermined signal socket in the environment, comprising the steps of:

- receiving said digital signals;

20 - operating a frequency conversion of the received digital signals;

- mixing said digital signals on a distribution network (8) that distribute said digital signals to the sockets (9)

characterized in that

in the step of frequency conversion of the received reserved digital signals, said
25 received digital signals are demodulated, and then remodulated with a sole type of digital modulation, then mixed with the other information signals in a common signal on the distribution network, from which are distributed to receivers fit to decode such sole type of digital modulation.

51. Method for the distribution to a condominium and/or community environment, of a plurality of digital signals, characterized in that such sole type of digital modulation is Quadrature Amplitude Modulation.